

CLAIMS:

1. A biochemical analysis unit comprising a substrate made of a material capable of attenuating radiation energy and/or light energy and formed with a plurality of holes, and a plurality of absorptive regions
5 formed by forming an absorptive region in every hole.
2. A biochemical analysis unit comprising a substrate made of a material capable of attenuating radiation energy and/or light energy and formed with a plurality of holes, and a plurality of absorptive regions formed by forming an absorptive region in every hole, the plurality of
10 absorptive regions being selectively labeled with at least one kind of labeling substance selected from a group consisting of a radioactive labeling substance, a labeling substance which generates chemiluminescent emission when it contacts a chemiluminescent substrate and a fluorescent substance by spotting specific binding
15 substances whose sequence, base length, composition and the like are known therein and specifically binding a substance derived from a living organism and labeled with at least one kind of said labeling substance with the specific binding substances.
3. A biochemical analysis unit in accordance with Claim 2 wherein
20 the substance derived from a living organism is specifically bound with specific binding substances by a reaction selected from a group consisting of hybridization, antigen-antibody reaction and receptor-ligand reaction.
4. A biochemical analysis unit in accordance with Claim 1 wherein the plurality of absorptive regions are formed by charging an absorptive
25 material in the plurality of holes formed in the substrate.
5. A biochemical analysis unit in accordance with Claim 2 wherein the plurality of absorptive regions are formed by charging an absorptive material in the plurality of holes formed in the substrate.

6. A biochemical analysis unit in accordance with Claim 1 wherein each of the plurality of holes is formed as a through-hole.
7. A biochemical analysis unit in accordance with Claim 2 wherein each of the plurality of holes is formed as a through-hole.
- 5 8. A biochemical analysis unit in accordance with Claim 1 wherein each of the plurality of holes is formed as a recess.
9. A biochemical analysis unit in accordance with Claim 2 wherein each of the plurality of holes is formed as a recess.
- 10 10. A biochemical analysis unit in accordance with Claim 1 wherein the substrate is formed of a flexible material.
11. A biochemical analysis unit in accordance with Claim 2 wherein the substrate is formed of a flexible material.
12. A biochemical analysis unit in accordance with Claim 1 wherein the substrate is formed with a gripping portion by which the substrate
15 can be gripped.
13. A biochemical analysis unit in accordance with Claim 2 wherein the substrate is formed with a gripping portion by which the substrate can be gripped.
14. A biochemical analysis unit comprising an absorptive substrate
20 formed of an absorptive material and a perforated plate formed with a plurality of through-holes and made of a material capable of attenuating radiation energy and light energy, the perforated plate being closely contacted with at least one surface of the absorptive substrate to form a plurality of absorptive regions of the absorptive substrate in the plurality
25 of through-holes formed in the perforated plate.
15. A biochemical analysis unit in accordance with Claim 14 wherein perforated plates are in close contact with the both surfaces of the absorptive substrate.

16. A biochemical analysis unit in accordance with Claim 14 wherein the perforated plate is formed with a gripping portion by which the perforated plate can be gripped.
17. A biochemical analysis unit in accordance with Claim 14 wherein
5 the plurality of absorptive regions are selectively labeled with at least one kind of labeling substances selected from a group consisting of a radioactive labeling substance, a labeling substance capable of generating chemiluminescent emission when it contacts a chemiluminescent substrate and/or a fluorescent substance by spotting specific binding
10 substances whose sequence, base length, composition and the like are known therein and hybridizing a substance derived from a living organism and labeled with at least one kind of labeling substance with the specific binding substances.
18. A biochemical analysis unit in accordance with Claim 1 which is
15 formed with 10 or more holes.
19. A biochemical analysis unit in accordance with Claim 2 which is formed with 10 or more holes.
20. A biochemical analysis unit in accordance with Claim 14 which is formed with 10 or more holes.
- 20 21. A biochemical analysis unit in accordance with Claim 18 which is formed with 1,000 or more holes.
22. A biochemical analysis unit in accordance with Claim 19 which is formed with 1,000 or more holes.
23. A biochemical analysis unit in accordance with Claim 20 which is
25 formed with 1,000 or more holes.
24. A biochemical analysis unit in accordance with Claim 21 which 10,000 or more holes.
25. A biochemical analysis unit in accordance with Claim 22 which

10,000 or more holes.

26. A biochemical analysis unit in accordance with Claim 23 which 10,000 or more holes.

27. A biochemical analysis unit in accordance with Claim 1 wherein
5 each of the plurality of holes has a size of less than 5 mm^2 .

28. A biochemical analysis unit in accordance with Claim 2 wherein
each of the plurality of holes has a size of less than 5 mm^2 .

29. A biochemical analysis unit in accordance with Claim 14 wherein
each of the plurality of holes has a size of less than 5 mm^2 .

10 30. A biochemical analysis unit in accordance with Claim 27 wherein
each of the plurality of holes has a size of less than 1 mm^2 .

31. A biochemical analysis unit in accordance with Claim 28 wherein
each of the plurality of holes has a size of less than 1 mm^2 .

15 32. A biochemical analysis unit in accordance with Claim 29 wherein
each of the plurality of holes has a size of less than 1 mm^2 .

33. A biochemical analysis unit in accordance with Claim 30 wherein
each of the plurality of holes has a size of less than 0.1 mm^2 .

34. A biochemical analysis unit in accordance with Claim 31 wherein
each of the plurality of holes has a size of less than 0.1 mm^2 .

20 35. A biochemical analysis unit in accordance with Claim 32 wherein
each of the plurality of holes has a size of less than 0.1 mm^2 .

36. A biochemical analysis unit in accordance with Claim 1 wherein
the plurality of holes are formed at a density of 10 or more per cm^2 .

25 37. A biochemical analysis unit in accordance with Claim 2 wherein
the plurality of holes are formed at a density of 10 or more per cm^2 .

38. A biochemical analysis unit in accordance with Claim 14 wherein
the plurality of holes are formed at a density of 10 or more per cm^2 .

39. A biochemical analysis unit in accordance with Claim 36 wherein

the plurality of holes are formed at a density of 1,000 or more per cm^2 .

40. A biochemical analysis unit in accordance with Claim 37 wherein the plurality of holes are formed at a density of 1,000 or more per cm^2 .

41. A biochemical analysis unit in accordance with Claim 38 wherein
5 the plurality of holes are formed at a density of 1,000 or more per cm^2 .

42. A biochemical analysis unit in accordance with Claim 39 wherein the plurality of holes are formed at a density of 10,000 or more per cm^2 .

43. A biochemical analysis unit in accordance with Claim 40 wherein the plurality of holes are formed at a density of 10,000 or more per cm^2 .

10 44. A biochemical analysis unit in accordance with Claim 41 wherein the plurality of holes are formed at a density of 10,000 or more per cm^2 .

45. A biochemical analysis unit in accordance with Claim 1 wherein
the material capable of attenuating radiation energy and/or light energy
has a property of reducing the energy of radiation and/or light to 1/5 or
15 less when the radiation and/or light travels in the material by a distance
equal to that between neighboring absorptive regions.

46. A biochemical analysis unit in accordance with Claim 2 wherein
the material capable of attenuating radiation energy and/or light energy
has a property of reducing the energy of radiation and/or light to 1/5 or
20 less when the radiation and/or light travels in the material by a distance
equal to that between neighboring absorptive regions.

47. A biochemical analysis unit in accordance with Claim 14 wherein
the material capable of attenuating radiation energy and/or light energy
has a property of reducing the energy of radiation and/or light to 1/5 or
25 less when the radiation and/or light travels in the material by a distance
equal to that between neighboring absorptive regions.

48. A biochemical analysis unit in accordance with 45 wherein the
material capable of attenuating radiation energy and/or light energy has

a property of reducing the energy of radiation and/or light to 1/10 or less when the radiation and/or light travels in the material by a distance equal to that between neighboring absorptive regions.

49. A biochemical analysis unit in accordance with 46 wherein the material capable of attenuating radiation energy and/or light energy has a property of reducing the energy of radiation and/or light to 1/10 or less when the radiation and/or light travels in the material by a distance equal to that between neighboring absorptive regions.

50. A biochemical analysis unit in accordance with 47 wherein the material capable of attenuating radiation energy and/or light energy has a property of reducing the energy of radiation and/or light to 1/10 or less when the radiation and/or light travels in the material by a distance equal to that between neighboring absorptive regions.

51. A biochemical analysis unit in accordance with 48 wherein the material capable of attenuating radiation energy and/or light energy has a property of reducing the energy of radiation and/or light to 1/100 or less when the radiation and/or light travels in the material by a distance equal to that between neighboring absorptive phosphor layer regions.

52. A biochemical analysis unit in accordance with 49 wherein the material capable of attenuating radiation energy and/or light energy has a property of reducing the energy of radiation and/or light to 1/100 or less when the radiation and/or light travels in the material by a distance equal to that between neighboring absorptive phosphor layer regions.

53. A biochemical analysis unit in accordance with 50 wherein the material capable of attenuating radiation energy and/or light energy has a property of reducing the energy of radiation and/or light to 1/100 or less when the radiation and/or light travels in the material by a distance equal to that between neighboring absorptive phosphor layer regions.

54. A biochemical analysis unit in accordance with Claim 45 wherein the substrate is formed of a material selected from a group consisting of metal material, ceramic material and plastic material.
55. A biochemical analysis unit in accordance with Claim 46 wherein
5 the substrate is formed of a material selected from a group consisting of metal material, ceramic material and plastic material.
56. A biochemical analysis unit in accordance with Claim 47 wherein the substrate is formed of a material selected from a group consisting of metal material, ceramic material and plastic material.
- 10 57. A biochemical analysis unit in accordance with Claim 1 wherein the absorptive region is formed of a porous material.
58. A biochemical analysis unit in accordance with Claim 2 wherein the absorptive region is formed of a porous material.
59. A biochemical analysis unit in accordance with Claim 14 wherein
15 the absorptive substrate is formed of a porous material.
60. A biochemical analysis unit in accordance with Claim 57 wherein the porous material includes a carbon material or a material capable of forming a membrane filter.
61. A biochemical analysis unit in accordance with Claim 58 wherein
20 the porous material includes a carbon material or a material capable of forming a membrane filter.
62. A biochemical analysis unit in accordance with Claim 59 wherein the porous material includes a carbon material or a material capable of forming a membrane filter.
- 25 63. A biochemical analysis unit in accordance with Claim 1 wherein the absorptive region is formed of a fiber material.
64. A biochemical analysis unit in accordance with Claim 2 wherein the absorptive region is formed of a fiber material.

65. A biochemical analysis unit in accordance with Claim 14 wherein the absorptive substrate is formed of a fiber material.

66. A biochemical analyzing method comprising the steps of preparing a biochemical analysis unit by spotting specific binding substances, which
5 can specifically bind with a substance derived from a living organism and whose sequence, base length, composition and the like are known, in a plurality of absorptive regions, each of which is formed in a plurality of holes formed in a substrate made of a material capable of attenuating radiation energy and specifically binding a substance derived from a
10 living organism and labeled with a radioactive labeling substance with the specific binding substances, superposing the biochemical analysis unit on a stimuable phosphor sheet in which a stimuable phosphor layer is formed so that the stimuable phosphor layer faces the plurality of absorptive regions, thereby exposing the stimuable phosphor layer to the
15 radioactive labeling substance contained in the plurality of absorptive regions, irradiating the stimuable phosphor layer exposed to the radioactive labeling substance with a stimulating ray, thereby exciting stimuable phosphor contained in the stimuable phosphor layer, photoelectrically detecting stimulated emission released from the
20 stimuable phosphor contained in the stimuable phosphor layer, thereby producing biochemical analysis data, and effecting biochemical analysis based on the biochemical analysis data.

67. A biochemical analyzing method in accordance with Claim 66 wherein a plurality of dot-like stimuable phosphor layer regions are
25 formed spaced-apart from each other in the stimuable phosphor sheet in the same pattern as that of the plurality of holes formed in the substrate of the biochemical analysis unit and the biochemical analysis unit and the stimuable phosphor sheet are superposed on each other so that each of

the plurality of dot-like stimuable phosphor layer regions faces one of the plurality of absorptive regions in the plurality of holes formed in the substrate of the biochemical analysis unit, thereby exposing the plurality of dot-like stimuable phosphor layer regions of the stimuable phosphor sheet to the radioactive labeling substance contained in the plurality of absorptive regions.

68. A biochemical analyzing method comprising the steps of preparing a biochemical analysis unit comprising an absorptive substrate formed of an absorptive material and a perforated plate made of a material capable of attenuating radiation energy and light energy and formed with a plurality of through-holes, the perforated plate being closely contacted with at least one surface of the absorptive substrate to form a plurality of absorptive regions of the absorptive substrate in the plurality of through-holes formed in the perforated plate, the plurality of absorptive regions being selectively labeled with a radioactive labeling substance by spotting specific binding substances, which can specifically bind with a substance derived from a living organism and whose sequence, base length, composition and the like are known, in the plurality of absorptive regions and specifically binding a substance derived from a living organism and labeled with a radioactive labeling substance, superposing the biochemical analysis unit and a stimuable phosphor sheet in which a stimuable phosphor layer is formed via the perforated plate so that the stimuable phosphor layer faces the plurality of absorptive regions, thereby exposing the stimuable phosphor layer to the radioactive labeling substance contained in the plurality of absorptive regions, irradiating the stimuable phosphor layer exposed to the radioactive labeling substance with a stimulating ray to excite stimuable phosphor contained in the stimuable phosphor layer, photoelectrically detecting

stimulated emission released from the stimuable phosphor contained in the stimuable phosphor layer to produce biochemical analysis data, and effecting biochemical analysis based on the biochemical analysis data.

69. A biochemical analyzing method in accordance with Claim 68
5 wherein a plurality of dot-like stimuable phosphor layer regions are formed spaced-apart in the stimuable phosphor sheet in the same pattern as that of the plurality of through-holes formed in the perforated plate, and the biochemical analysis unit and the stimuable phosphor sheet are superposed on each other so that each of the plurality of dot-like
10 stimuable phosphor layer regions faces one of the plurality of absorptive regions via one of the through-holes formed in the perforated plate, thereby exposing the plurality of dot-like stimuable phosphor layer regions to a radioactive labeling substance contained in the plurality of absorptive regions.

70. A biochemical analyzing method comprising the steps of preparing
15 a biochemical analysis unit by spotting specific binding substances, which can specifically bind with a substance derived from a living organism and whose sequence, base length, composition and the like are known, in a plurality of absorptive regions formed in a plurality of holes formed in a
20 substrate made of a material capable of attenuating light energy and specifically binding a substance derived from a living organism and labeled with a fluorescent substance with the specific binding substances, thereby selectively labeling a plurality of absorptive regions, irradiating the biochemical analysis unit with a stimulating ray, thereby exciting the
25 fluorescent substance, photoelectrically detecting fluorescence released from the fluorescent substance, thereby producing biochemical analysis data, and effecting biochemical analysis based on the biochemical analysis data.

71. A biochemical analyzing method comprising the steps of preparing a biochemical analysis unit by spotting specific binding substances, which can specifically bind with a substance derived from a living organism and whose sequence, base length, composition and the like are known, in a plurality of absorptive regions formed in a plurality of holes formed in a substrate made of a material capable of attenuating light energy and specifically binding a substance derived from a living organism and labeled with a labeling substance capable of generating chemiluminescent emission when it contacts a chemiluminescent substrate with the specific binding substances, thereby selectively labeling the plurality of absorptive regions, bringing the biochemical analysis unit into close contact with a chemiluminescent substrate, photoelectrically detecting chemiluminescent emission released from the labeling substance, thereby producing biochemical analysis data, and effecting biochemical analysis based on the biochemical analysis data.

72. A biochemical analyzing method comprising the steps of preparing a biochemical analysis unit by spotting specific binding substances, which can specifically bind with a substance derived from a living organism and whose sequence, base length, composition and the like are known, in a plurality of absorptive regions formed in a plurality of holes formed in a substrate made of a material capable of attenuating light energy and specifically binding a substance derived from a living organism and labeled with a fluorescent substance and a labeling substance capable of generating chemiluminescent emission when it contacts a chemiluminescent substrate with the specific binding substances, thereby selectively labeling the plurality of absorptive regions, irradiating the biochemical analysis unit with a stimulating ray to excite the fluorescent substance, and photoelectrically detecting fluorescence released from the

fluorescent substance, thereby producing biochemical analysis data, while bringing the biochemical analysis unit into close contact with a chemiluminescent substrate, photoelectrically detecting chemiluminescent emission released from the labeling substance, thereby
5 producing biochemical analysis data, and effecting biochemical analysis based on the biochemical analysis data.

73. A biochemical analyzing method comprising the steps of bringing an absorptive substrate made of an absorptive material and formed with a plurality of absorptive regions by spotting thereon specific binding
10 substances, which can specifically bind with a substance derived from a living organism and whose sequence, base length, composition and the like are known, the plurality of the absorptive regions being selectively labeled by specifically binding a substance derived from a living organism and labeled with a fluorescent substance with the specific binding
15 substances contained in the plurality of absorptive regions, into close contact with a perforated plate made of a material capable of attenuating light energy and formed with a plurality of through-holes at positions corresponding to the plurality of absorptive regions formed in the absorptive substrate, irradiating the plurality of absorptive regions
20 formed in the absorptive substrate through the plurality of through-holes formed in the perforated plate to stimulate the fluorescent substance, photoelectrically detecting fluorescence released from the fluorescent substance, thereby producing biochemical analysis data, and effecting biochemical analysis based on the biochemical analysis data.

25 74. A biochemical analyzing method comprising the steps of bringing an absorptive substrate made of an absorptive material and formed with a plurality of absorptive regions by spotting thereon specific binding substances, which can specifically bind with a substance derived from a

living organism and whose sequence, base length, composition and the like are known, the plurality of the absorptive regions being selectively labeled by specifically binding a substance derived from a living organism and labeled with a labeling substance capable of generating chemiluminescent emission when it contacts a chemiluminescent substrate with the specific binding substances contained in the plurality of absorptive regions, into close contact with a perforated plate made of a material capable of attenuating light energy and formed with a plurality of through-holes at positions corresponding to the plurality of absorptive regions formed in the absorptive substrate, bringing a chemiluminescent substrate into close contact with the plurality of absorptive regions formed in the absorptive substrate through the plurality of through-holes formed in the perforated plate, photoelectrically detecting chemiluminescent emission released from the labeling substance, thereby producing biochemical analysis data, and effecting biochemical analysis based on the biochemical analysis data.

75. A biochemical analyzing method comprising the steps of bringing an absorptive substrate made of an absorptive material and formed with a plurality of absorptive regions by spotting thereon specific binding substances, which can specifically bind with a substance derived from a living organism and whose sequence, base length, composition and the like are known, the plurality of the absorptive regions being selectively labeled by specifically binding a substance derived from a living organism and labeled with a fluorescent substance and a labeling substance capable of generating chemiluminescent emission when it contacts a chemiluminescent substrate with the specific binding substances contained in the plurality of absorptive regions, into close contact with a perforated plate made of a material capable of attenuating light energy

and formed with a plurality of through-holes at positions corresponding to the plurality of absorptive regions formed in the absorptive substrate, irradiating the plurality of absorptive regions formed in the absorptive substrate through the plurality of through-holes formed in the perforated plate to stimulate the fluorescent substance, and photoelectrically detecting fluorescence released from the fluorescent substance, thereby producing biochemical analysis data, while bringing a chemiluminescent substrate into close contact with the plurality of absorptive regions formed in the absorptive substrate through the plurality of through-holes formed in the perforated plate, and photoelectrically detecting chemiluminescent emission released from the labeling substance, thereby producing biochemical analysis data, and effecting biochemical analysis based on the biochemical analysis data.

76. A biochemical analyzing method comprising the steps of preparing a stimuable phosphor sheet including a support, selectively storing radiation energy in a plurality of stimuable phosphor layer regions formed at least one-dimensionally and spaced-apart from each other in the support, moving the stimuable phosphor sheet and a stimulating ray relative to each other in at least a main scanning direction, sequentially irradiating the plurality of stimuable phosphor layer regions with the stimulating ray, thereby exciting stimuable phosphor contained in the plurality of stimuable phosphor layer regions, photoelectrically detecting stimulated emission released from the stimuable phosphor, thereby producing analog data, converting the analog data to digital data and producing biochemical analysis data.